

APPENDIX C

IMPROVED ARTILLERY MUNITIONS

This appendix describes the following special-purpose field artillery ammunition:

- *Family of scatterable mines.*
- *Laser-guided field artillery projectile (Copperhead).*
- *Obscurant smoke.*

Family of Scatterable Mines

Types of FA-Delivered FASCAM

FA-delivered FASCAM allows the maneuver commander to quickly emplace a minefield. There are two types of FA-delivered FASCAM: area denial artillery munitions (ADAM) (antipersonnel mines) and the remote antiarmor mine system (RAAMS) (for use against lightly armored vehicles). Both are available only in 155 mm. FASCAM has two preset self-destruct times: short duration (unclassified self-destruct time of less than 24 hours) and long duration (unclassified self-destruct time of greater than 24 hours). The corps commander has the authority to employ FASCAM. Employment may be delegated for specific operations or for limited periods of time as follows:

- Long-duration mines down to maneuver brigade.
- Short-duration mines down to maneuver battalion.

Engineer Officer's Responsibility

The engineer officer is responsible for providing expertise on the employment of all

types of FASCAM; however, the FSO provides the technical expertise to the engineer concerning the employment of FA-delivered FASCAM. The advisor to the engineer officer concerning FASCAM delivered by the Air Force is the ALO.

Defensive Capabilities

Capabilities in the defense include the following:

- Close gaps and lanes in other obstacles.
- Reseed breeched minefields.
- Delay or disrupt attacking forces.
- Deny enemy unrestricted use of areas.
- Disrupt movement and commitment of second-echelon forces.
- Develop targets for long-range antitank weapons.
- Disrupt and harass enemy command and control, logistics, or staging areas.
- Reinforce existing obstacles.
- Disrupt or delay river crossings.

Offensive Capabilities

Capabilities in the offense include the following:

- Supplement flank reconnaissance and security forces in protecting flanks along avenues of approach.
- Suppress and disrupt enemy security elements once contact has been made.
- Hinder withdrawal of enemy forces.
- Hinder the ability of the enemy to reinforce the objective area.

Employment Options

FASCAM may be delivered by itself— either all RAAMS, all ADAM, or a combination of both. If RAMMS and ADAM are employed on the same target, ADAM is fired as the last volley.

FASCAM may be delivered in conjunction with other munitions. If so, it extends the effects of those munitions; for example, firing ADAM into a logistic site after firing DPICM. If fired in conjunction with other munitions, FASCAM is delivered in the last volleys.

Employment Considerations

Delivery error and availability of tubes may limit FASCAM use. Normally, FASCAM requires large amounts of ammunition delivered with high-angle fire. This adversely affects FA survivability. Also, the FA units normally must provide other types of fires while delivering FASCAM.

FA-delivered FASCAM has reduced effectiveness on hard surfaces such as concrete and asphalt.

Logistic requirements for FA are increased. Normally, FA units carry only short-duration mines. If long-duration mines are to be used,

the FA unit must be notified well in advance to allow transport from the ASP to the firing unit.

FSO's Responsibilities

Normally, the FSO obtains the safety zone (minefield size) of the minefield either by calculating it himself or by having it calculated by the DS battalion S3. The engineer is responsible for disseminating the safety zone.

Delivery

Normally, FASCAM is delivered at high-angle fire. The exact number of rounds depends on the size of the minefield, the minefield density, and whether the rounds are delivered by high-angle or low-angle fire (RAAMS only). For specific employment (for example, aimpoints and number of rounds), see FM 6-20-40 or FM 6-20-50.

Laser-Guided Field Artillery Projectile (Copperhead)

Description

Copperhead is a 155-mm cannon-launched guided projectile (CLGP) with a shaped-charge warhead and a laser seeker. When fired at a moving or stationary hard point target, Copperhead homes in on laser energy reflected from the target during the final portion of its trajectory. Laser energy is provided by a remote laser designator. Optimum use of Copperhead is against multiple targets in large target arrays outside the range of maneuver direct-fire weapon systems (approximately 3,000 meters). Single targets or very few, widely separated targets may be engaged by Copperhead if they are high-value targets; for example, an enemy commander's vehicle. Targets appearing within the range of maneuver direct-fire weapon systems should be engaged by Copperhead only when the maneuver commander directs or when the direct-fire systems are unable to engage them.

Strengths

Copperhead has high hit probability on point targets, moving or stationary, at longer ranges than possible with current direct-fire weapons.

Copperhead is extremely lethal.

A rapid rate of fire is possible against an array of targets within the same footprint because of volley fire.

A laser designator does not have the pronounced firing signature of an antitank guided missile.

Weaknesses

Responsiveness of the system depends on several variables created by distinct acquisition and delivery components of the system and by the weather.

Weather can limit performance. Cloud-free line of sight from the projectile path to the target is required for target acquisition and engagement. The ground/vehicular laser locator designator (G/VLLD) operator must be able to visually acquire (see) the target.

The G/VLLD and operator are vulnerable to suppressive fires.

The Copperhead system depends on two-way communications between the operator and the firing battery FDC.

Effectiveness of target engagement is limited by the operator's ability to track the target during the last 13 seconds of flight of the round.

The emitted signal from the designator can be detected.

The success of the Copperhead depends greatly on reflected energy. Therefore, the company FSO should ensure the G/VLLD is positioned to optimize the system capabilities

and to complement the direct-fire weapons. Laser designation requires an uninterrupted line of sight between the designator and the target. Anything that obstructs or weakens the laser signal will cause a significant decrease in the performance of the round. Remember that terrain, vegetation, fog, smoke, precipitation, and dust obstruct visibility; and the maximum range is 5,000 meters to a stationary target for effective use of the Copperhead round.

Employment

Copperhead targets can be engaged as either planned targets or targets of opportunity. Planned targets are the preferred method of engagement, because the firing battery requires less reaction time. Normally, the target-of-opportunity technique is used only during mobile operations and before planned targets are developed.

The Copperhead and the designator must have identical laser switch settings (laser pulse codes). Switch settings are assigned to observers on a semipermanent basis. They are changed only for cause; for example, changes in the organization for combat that cause duplication of settings in adjacent units. Switch settings are sent as part of the message to observer to ensure that the appropriate switch setting has been applied. Laser pulse codes are controlled and allocated by the corps FS cell. A clear SOP should be established for allocation and control.

NOTE: For an in-depth discussion of the Copperhead and its employment, refer to FM 6-30.

Obscurant Smoke

Offensive Operations

Obscurants have many applications on the battlefield. During offensive operations, obscurants are used to conceal units and

individual weapon systems. This enables the commander to maneuver behind a screen and to deceive the enemy about his strength and position. Obscurants are also used to blind acquisition means.

Defensive Operations

During defensive operations, obscurants are used to separate and isolate attacking echelons, create gaps, disrupt enemy weapon systems, force mechanized infantry to dismount, and make enemy targets easier to hit. It also may conceal defensive positions.

Applications

Four general applications of obscurants on the battlefield are as follows:

- **Obscuration** — smoke placed on or near the enemy position to interfere with enemy observation of the battlefield.
- **Screening** — smoke placed within areas of friendly operations or in areas between friendly and enemy forces to degrade enemy observation and fire. It is primarily intended to conceal friendly forces.
- **Marking and signaling** — smoke used to communicate actions on the battlefield or to mark locations.
- **Deception** — smoke used in conjunction with other actions to confuse or mislead the enemy. Generally, this is used in conjunction with other deceptive measures.

Employment Considerations

To be effective, smoke must be used in sufficient quantities. Factors affecting the quantity are atmospheric conditions, type of smoke required, size of the area to be

smoked, and length of time needed. On the basis of those factors, excessive amounts of ammunition may be required to meet the commander's guidance. Also, FA survivability is adversely affected when firing long-duration smoke screens.

Smoke adversely affects battlefield systems that must operate in concert, such as TACAIR, armor, infantry, field artillery, and Army aviation.

Smoke hinders visual communications, causing the unit to rely to a greater degree on radios.

Sources

Mortars can deliver a high volume of smoke at midranges and are the most rapid and effective indirect delivery means. Both 81-mm and 107-mm weapons deliver WP.

Field artillery cannons can deliver smoke out to distant targets. They can deliver hydrogen chloride (HC) and WP. However, as smoke is available in limited quantities, excessive use should be planned in advance.

Smoke pots can produce large volumes of smoke for extended periods of time. They are the commander's primary means of producing small smoke screens.

Additional smoke sources which should be considered when planning smoke operations include —

- Mechanical smoke generators.
- Air-delivered smoke.
- Vehicular smoke grenade launchers.
- Vehicle engine exhaust smoke systems.
- Battlefield dust and obscurants.